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DICKSTEIN SHAPIRO LLP				
1633 Broadway				
NEW YORK, NY 10019				
EXAMINER				
THIRUGANAM, GANDHI				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/573,913

Applicant(s)

ISHIYAMA, RUI

Examiner

GANDHI THIRUGANAM

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3, 5, 6, 11-14, 16, 17, 21-25, 27, 28, 32 and 33 is/are rejected.
7) ☒ Claim(s) 4, 7-10, 15, 18-20, 26 and 29-31 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 30 March 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Final Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Remarks

1. The response received on 30 March 2006 has been placed in the file and was considered by the examiner. An action on the merits follows.

Claims 1-33 are pending.

The independent method claim 12 is not explicitly tied to a particular machine nor does it perform a transformation. While the method is not explicitly tied to a machine, it is implicitly tied to a processor as the claim can not be done reasonably by hand.

Drawings

2. Figure 14 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Fig. 14 is state as Prior Art on page 1 Lines 20-22 as well as page 8 Lines 24-26, among other locations.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because

The Abstract must remove all references to the figures, for example Line 1 "(170)".

The Abstract as currently written has greater than 150 words (171 words with the drawing labels removed).

The Abstract uses legal phraseology of "means".

Correction is required. See MPEP § 608.01(b).

Claim Objections

5. Claims 2-11, 13-22 and 24-33 are objected to because of the following informalities:

Claim 2 line 1 recites "An estimation system". Should this be "The estimation system"?

Claims 3-11, 13-22 and 24-33 are objected to under the same reasoning as claim 2 above.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows (see also MPEP 2106):

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

7. Claim 23 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 23 defines a "program" embodying functional descriptive material (i.e., a computer program or computer executable code). However, the claim does not define a "computer-readable medium or computer-readable memory" and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

"A transitory, propagating signal ... is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be

patentable subject matter." (In re Nuijten, 84 USPQ2d 1495 (Fed. Cir. 2007)). Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. Should the applicant's specification define or exemplify the computer readable medium or memory (or whatever language applicant chooses to recite a computer readable medium equivalent) as statutory tangible products such as a hard drive, ROM, RAM, etc, as well as a non-statutory entity such as a "signal", "carrier wave", or "transmission medium", the examiner suggests amending the claim to include the disclosed tangible computer readable storage media, while at the same time excluding the intangible transitory media such as signals, carrier waves, etc.

Merely reciting functional descriptive material as residing on a "tangible" or other medium is not sufficient. If the scope of the claimed medium covers media other than "computer readable" media (e.g., "a tangible media", a "machine-readable media", etc.), the claim remains non-statutory. The full scope of the claimed media (regardless of what words applicant chooses) should not fall outside that of a computer readable medium.

The Examiner suggests amending the claim to "An estimation program for estimating an object state residing on a computer recording medium, which causes ..."

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

9. Claims 1-2, 6, 11-13, 17, 22-24, 28 and 33 are rejected under 35 U.S.C. 102(a) as being anticipated by AAPA (Applicant's Admitted Prior Art), hereafter referred to as AAPA.

Regarding **claim 1**, AAPA discloses an estimation system for estimating an object state, characterized by comprising:

image input means for inputting an input image containing an object whose state is to be estimated, the state being at least one of a position and posture; (AAPA, *pg. 2 Lines 2-9, "Input Image Data containing image of an object As a position/posture estimation ..."*)

3D shape data storage means for storing 3D shape data of the object; (AAPA, *pg. 2 Line 16, "3D shape model data"*)

comparison image generation means for generating, as a comparison image, an image containing the object in a predetermined state by using the 3D shape data stored

in said 3D shape data storage means; (AAPA, pg. 2 Line 20 – pg. 3 Line 2 “the comparison image generation means 920 generates illumination variation space data which represents an image variation caused by a change in illumination condition when the target object has a position/posture corresponding to each position/posture estimation value group. The comparison image generation means 920 generates a comparison image group under the same illumination condition as that for the input image data 91 on the basis of the illumination variation space data”, where the predetermined state is the first underlined section and comparison image is the comparison image group)

image positional relationship detection means for detecting, for each sub-region having a predetermined size in the image, a positional relationship between the input image and the comparison image generated by said comparison image generation means; (AAPA, pg. 2 lines 6-15, where the initial target image has parameters containing known errors, where the parameters are X, Y, Z-axis directions and X, Y, and Z-axes angle parameters, and the comparison images are created by “changing six position/posture parameters (3D parameters ... contained by the position/posture initial value by a predetermined variation” where the position relationship is based on the predetermined variation. The sub-region is the “target object” which has the predetermined size as the same as in the 3D shape model data)

correction amount calculation means for calculating a correction amount of the object state in the comparison image by using the positional relationship detected by

said image positional relationship detection means; and (AAPA, pg. 3 Lines 3-7, *where the optimum position/posture estimation value is the correction amount*)

state correction means for correcting the object state set in comparison image generation by said comparison image generation means by using the correction amount obtained by said correction amount calculation means, thereby calculating a new object state. (AAPA, pg. 3 Lines 7-18, *"the end determination means replaces the optimum position/posture estimation value with the position/posture estimation initial value and outputs the value ...", where the new object state is the new optimum position/posture estimation value*)

Claims 12 and 23 are rejected under the same reasoning as claim 1 above.

Regarding **claim 2**, AAPA discloses an estimation system for estimating an object state according to claim 1, characterized by further comprising state determination means for determining on the basis of the correction amount obtained by said correction amount calculation means whether the object state set by said comparison image generation means is appropriate, (AAPA (pg. 3 Lines 3-14))

wherein when it is determined that the object state is appropriate, the object state set by said comparison image generation means is output as an estimation value, and (AAPA (pg. 3 Lines 3-14))

when it is determined that the object state is not appropriate, estimation processing including the comparison image generation processing by said comparison image generation means, the positional relationship detection processing by said image

positional relationship detection means, and the correction amount calculation processing by said correction amount calculation means is executed again by setting the new object state calculated by said state correction means to the predetermined state. (AAPA (pg. 3 Lines 3-14), based on if there is "room for improvement of the similarity of the comparison" the object is either output or the new optimum position/posture estimation value replace the initial value (or current position estimation value))(AAPA (pg. 3 lines 14-17) discloses "repeatedly executes the above-described processing until the similarity of the comparison image cannot be improved")

Claims 13 and 24 are rejected under the same reasoning as claim 2 above.

Regarding **claim 6**, AAPA discloses an estimation system for estimating an object state according to claim 1, characterized in that said comparison image generation means comprises: means for reproducing a luminance value of an object surface, which changes depending on an illumination condition; and (AAPA, pg. 2 lines 16-25, "illumination variation space data")

means for generating the comparison image under an illumination condition close to that for the input image by using the reproduced luminance value. (AAPA, pg. 2 line 25- pg. 3 line 2, "comparison image group under the same illumination condition ...")

Claims 17 and 28 are rejected under the same reasoning as claim 6 above.

Regarding **Claim 11**, AAPA discloses an estimation system for estimating an object state according to claim 1, characterized by further

comprising feature extraction means for extracting an image feature amount of each of the input image and comparison image on the basis of luminance values of the input image and the comparison image generated by said comparison image generation means, wherein said image positional relationship detection means detects the positional relationship between the input image and the comparison image for each sub-region on the basis of the image feature amount extracted by said feature extraction means. (AAPA, pg. 2 lines 2-15, where the image data contains luminance values, the target object is the feature that is extracted from the target image and the comparison image means, and the shape model data is compared to the feature amounts (object) (pg. 2 lines 16-25)

Claims 22 and 33 are rejected under the same reasoning as claim 11 above.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5, 14 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Burtnyk (Patent 5,471,541), hereafter referred to as Burtnyk.

Regarding **claim** , AAPA discloses an estimation system for estimating an object state according to claim 2, but does not disclose

“characterized in that said state determination means determines that the object state is appropriate when the correction amount obtained by said correction amount calculation means is smaller than a predetermined amount, and determines that the object state is not appropriate when the correction amount is not smaller than the predetermined amount.” *(AAPA discloses determining whether the object state is appropriate based on room for improvement, but does not disclose specifically how it is done, Burtnyk Col. 4 Lines 49-50 discloses the well known method of comparison of a correction amount with a threshold)*

It would have been obvious to one of ordinary skill in the art at the time of invention to modify AAPA with Burtnyk for the purpose of creating a stop condition in an iterative process.

Claim 14 and 25 are rejected under the same reasoning as claim 3 above.

12. Claims 5, 16 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Yang (Patent 6,580,810), hereafter referred to as Yang.

Regarding **claim 5**, AAPA discloses an estimation system for estimating an object state according to claim 1, but does not disclose

"wherein said image input means comprises means for inputting a moving image containing an object, and said image positional relationship detection means uses a latest frame image of the moving image as the input image." (*Yang, Abstract*)

It would have been obvious to one of ordinary skill in the art at the time of invention to modify AAPA with Inoue for the purpose of estimating a moving object.

Claims 16 and 27 are rejected under the same reasoning as claim 5 above.

Allowable Subject Matter

13. Claims 4, 7-10, 15, 18-20, 26 and 29-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ishiyama (PGPub 2003/0035098) Fig. 3-5 and 8-9

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GANDHI THIRUGNANAM whose telephone number is (571)270-3261. The examiner can normally be reached on M-Th, 7:30am to 6pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gandhi Thirugnanam/
Examiner, Art Unit 2624

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